U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB80-120538

MSIS Training Final Report B

Cincinnati Univ, OH Southwestern Ohio Regional Computer Center

Prepared for

Environmental Protection Agency, Washington, DC Office of Drinking Water

1979

PB80-120536

FINAL REPORT B,

MSIS TRAINING

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

Task Assignment No. OWS-77-02

FINAL REPORT B,

MSIS TRAINING

Prepared for the

U.S. Environmental Protection Agency
Office of Drinking Water
Washington, D.C. 20460
Contract No. GS-05S-10458

by the

University of Cincinnati Computer Center/
SouthWestern Ohio Regional Computer Center
Cincinnati, Ohio

1979

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ACKNOWLEDGEMENTS

The list of acknowledgements for preparation of the final report covering the long and complex MSIS Training Program is vast. First, Norbert Buller and Jo Ann Storey helped design, conduct, and prepare the report for the MSIS team training; Mary Schwab and Mr. Buller prepared a report on the observer function; Mr. Buller and Ms. Storey wrote the Team Development paper; Ms. Schwab rewrote and clarified a paper setting forth the SWORCC Training Philosophy; Daun Lameier drafted the first two sections of the final report; and finally, Ms. Storey molded all of these inputs into a comprehensive whole. Avrum W. Marks of the Office of Drinking Water, EPA Headquarters, contributed to the general design of the report and made many helpful suggestions on the final draft. SWORCC's Contract Services Director, A. Jerome York, provided indispensable clerical and moral support. Ellen Miller, Assistant Director for MSIS during the project, assumed additional responsibilities to allow me time to manage all preparations. I am indeed grateful for both the quality and quantity of all these efforts. To those whom I have inadvertently overlooked, my apologies and thanks.

Joseph L. Bagby

Training Manager

ABSTRACT: MSIS FINAL REPORT

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The purpose of this report is to describe the process and effectiveness of the training program developed by the Southwestern Ohio Regional Computer Center for the Office of Drinking Water, Environmental Protection Agency, to aid State and Regional personnel in the installation and use of the Model State Information System. This training program was developed using theoretical information concerning adult learning, and consisted of a five-day, team-taught, on-site presentation in twenty-six States and Regions. A unique aspect of the training program was the use of an objective observer as a training team member. The role of the observer was seen as critical to continuous improvement of the training by supplying objective, immediate feedback to the trainers.

Trainee learning was evaluated from both a subjective and objective point of view. These data clearly showed the effectiveness of the training program in achieving its goal of increasing the MSIS capabilities of trainees. The participants rated the quality of the training very highly, but felt they needed even more training in order to master the complexity of the Model State Information System. The percentage of correct answers increased substantially from pre-test to post-test evaluations of information about the system. The amount of prior knowledge (as indicated by pre-test scores) was the best predictor of post-test scores. The level of education and knowledge of data processing were important early in the training, but became less important in the latter training phases.

PURPOSE

The purpose of this report is to describe the process and effectiveness of the training program developed to prepare State and Regional personnel for installation and use of the Model State Information System (MSIS).

The SouthWestern Ohio Regional Computer Center (SWORCC) was responsible to the Office of Drinking Water (ODW) of the Environmental Protection Agency (EPA) for the detailed planning and programming of a computer-based management information system to aid States and Regions in monitoring the quality of public drinking water. In addition, SWORCC was to develop a program of instruction to train personnel in the use of MSIS.

This report contains the following sections: Background Information, Development of the Training Strategy, Training the Training Teams, MSIS Training in the Field, Evaluation of the MSIS Training Process, Conclusions and Recommendations, and References.

BACKGROUND INFORMATION

The Safe Drinking Water Act (SDWA), PL 93-523, was passed by Congress on December 16, 1974. The primary objective of the SDWA was to insure that water supply systems which serve the public meet minimum national standards for the protection of public health; that is, to assure that the public is provided with safe drinking water. Congress authorized the EPA to establish standards for all harmful contaminants - standards which would apply to all public water systems. Administrative responsibility for carrying out the provisions of the SDWA was assigned to the Office of Water Supply (now the Office of Drinking Water). Although development of the specific regulations was to be done at the federal level, provisions were made for the individual States to assume primary responsibility for enforcement, record keeping, and reporting to the federal government.

The National Interim Primary Drinking Water Regulations were developed by the Environmental Protection Agency to delineate the maximum contaminant level permissible for bacteriological, chemical, biological, and radiological substances or matter in water. Realizing that the task of monitoring and reporting violations of the regulations would constitute a major task for the States, the EPA contracted with the American Management System (AMS) to undertake an analysis of the needs and preferences of the States in order to meet the requirements of the SDWA. A preliminary survey, conducted in 1975, indicated that the majority of the States would prefer a computer-based management information system to store and process the required information. A later

study showed that most of the States preferred a decentralized system which would offer greater flexibility and accessibility for report generation, data processing, and file maintenance than would a centralized system accessed by remote terminals. In June, 1976, AMS recommended the development of a customized, decentralized, Model State Information System (MSIS) to meet the joint federal-State responsibilities outlined in the SDWA and the implementing regulations.

The EPA subsequently contracted with SWORCC for the detailed system design, programming, testing, and documentation of the computerized MSIS. A second contract with SWORCC authorized an assessment of the needs of the States and Regions for aid in the installation of MSIS, and the development of appropriate training packages based on those needs. A Background Information Package (BIP) was distributed to all States through the ten EPA Regional offices, to ascertain the level of knowledge of the potential trainee population and the types of training desired by the personnel to be involved with MSIS.

The BIP data indicated that the backgrounds of State personnel varied widely. It was concluded that training was needed for all personnel to be involved with MSIS, from data entry clerks to top managers of water program departments. Additionally, the personnel in need of training were often widely dispersed geographically. Based on this information, the decision was made to offer a training program conducted in the State for selected State and Regional personnel and to supplement this program with a stand-alone slide/cassette training package. This package incorporated a sequential slide presentation, electronically synchronized tape cassettes, and a corresponding workbook.

An additional factor which had to be considered in designing the MSIS training program was the wide variation among the States in prior experience with monitoring public water supplies. Some States had to deal with thousands of water supplies, while others had only a few hundred. Additionally, the amount of procedural change required with the introduction of the MSIS varied greatly from State to State - for some the transition was relatively easy, while for others a major reorganization of management procedures and personnel was necessary. The perception of great variation between States was further established by the differences found in pre-test scores of MSIS knowledge (see Tables 6 and 7 in "Evaluation of the MSIS Training Process").

Recognition of the complexities of the Model State Information System (73 program modules; 70 input forms; 50 standard reports; over four feet of system documentation; and more than 200,000 lines of ANS COBOL source code) and the potential for waste of resources, inefficiency in reporting, and inaccuracy in meeting compliance requirements of the Safe Drinking Water Act, led the officials of the Office of Drinking Water, EPA, to support plans

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for incorporating a training program as part of the MSIS development.

The content and design of the training program was developed by SWORCC personnel in conjunction with consultants from the Faculty Resource Center of the University of Cincinnati. The MSIS training program as it finally evolved was seen as critical in avoiding some of the failures the U.S. government has experienced in the past with the implementation of technically sound computer programs (Rubin, et al, 1976).

A search of the literature concerned with adult learning, training techniques, and teaching effectiveness was made to insure that decisions were made on a sound theoretical and factual basis. A review of this literature, and the decisions which were incorporated in the MSIS training design, are described below.

DEVELOPMENT OF THE TRAINING STRATEGY

The literature review focused on issues determined to be of importance in developing an appropriate training strategy: characteristics of adult learners, functions of training, aspects of computer-related training, possible training strategies, and the use of open systems theory as a theoretical framework within which to develop the training.

The Adult Learner

Knowles (1972) has described four critical characteristics of adult learners which differentiate this group from the traditional younger student, and has proposed educational strategies to meet these characteristics. First, the adult learner has moved from being a dependent personality to being self-directed, and is ready to assume increasing responsibility for his/her own learning. Adult learners have accumulated a growing body of personal experience, and learn best in situations where their experiences and those of others are used as resources in the learning process. Readiness for learning becomes less tied to biological and academic factors, and increasingly influenced by role requirements. Thus, the adult learns better when knowledge is related to needs and interests - in this case, needs and interests related to occupational roles. Finally, the time perspective of the adult shiftsfrom deferred to immediate application, and as a result the adult learns better if the skills, knowledge, attitudes, and values to be taught are relevant to current life situations. The design of a training program aimed at adult learners must take these four critical factors into consideration.

MSIS training was conceived to take place in an adult environment. An informal atmosphere in which participants and trainers could interact as peers was established for the training. Careful selection of the physical setting, including moveable chairs and tables, was made prior to training. The experience and expertise of the participants were utilized whenever possible. Recognition that many of the participants had invaluable knowledge of water program management practices led to incorporation of their experiences in the training. The teams used actual State regulations and, whenever possible, presented the material using information supplied by the State. A variety of teaching techniques (lectures, slides, newsprint, small group discussion, large group discussion, simulation and problem solving) were incorporated throughout the training. In particular, discussion of mutual concerns between data processing and water program personnel was encouraged. The training teams were service oriented, their main purpose being to facilitate maximum learning about MSIS for concerned personnel in the States and Regions.

Functions Of Training

Johnson (1976) has defined the purpose of training as changing the behaviors of individuals by giving them additional specific items of knowledge, skill, or attitude needed to work up to the standard of performance required for their jobs. In a given organization, training may be utilized to solve any of a number of problems (e.g., increase productivity, introduce new processes, or implement new policies). In a period characterized by rapid social change, technological innovation, and the knowledge explosion, training has necessarily become an integral part of most organizations.

Knowledge, skill, and attitude change goals were set for MSIS training. An understanding of the background and purpose of the MSIS system was desired, as was acquisition of the ability to use the input and output forms provided with MSIS. Finally, it was felt that the training should and could provide growth in the trainees' confidence in their ability to use and operate the system.

Computer-Related Training

The introduction of automated data processing equipment in virtually every type of organization in the United States has been accompanied by an increased awareness of the need to provide training in the use of computer systems. Educational, industrial, retail, financial, transportation, military, and governmental organizations have become heavily dependent on the use of computers as the basic tool in information storage and retrieval, decision making, and report preparation (Benice, 1970; Gentle,

1965; Grossman and Howe, 1965; Hearle and Mason, 1965; Ocon, 1978; Rosenheim, 1977).

McConnell and Setaro (1976) provide an historical overview of the development of computer-related training. In the early stages, very few personnel were trained in computer usage other than the data processing personnel responsible for computer operations. Training was technical in nature, and was most often provided by the computer manufacturer for people selected by the organization, such as computer operators, keypunch operators, programmers, etc. Computer usage and the corresponding need for training were usually located in the financial and accounting areas, and had little impact in other areas of the organization.

Recognition of the tremendous potential for the use of high speed data processing equipment in areas other than financial, coupled with the development of smaller, less expensive, and faster computers, led many organizations to experiment with new functions for the computer in virtually all operations, often accompanied by the establishment of a computer staff department which provided vital services for the total organization. This expansion of computer usage generated new training needs in many organizations, particularly for personnel not trained in the technical aspects of data processing. Thus, computer related training in organizations came to assume two aspects: technical training for those actually working with the computer, and training for those personnel within the organization who use the services provided by data processing personnel.

Technical training for data processing personnel used several resources: the computer manufacturer, private schools and technical training programs, public schools, on-the-job training, in-house training sessions, and training programs purchased from specialty organizations. Until recently, most training programs for non-technical personnel involved teaching them to understand the basic technology and functioning of the computer. This training design was well-intended, but it failed to accomplish what should have been its basic objective: training in computer-related skills -- in understanding <u>how</u> <u>to</u> <u>use</u> data processing services (McConnell and Setaro, 1976).

McConnell and Setaro further suggest that non-management, non-technical, personnel need to know how to read and understand the output of data processing - how to read codes and understand the formats of reports. In addition, since non-technical personnel often provide the data, there is a need for knowledge of how to present the data in an accurate and error-free manner. Management personnel have other training requirements - learning to identify information needs and to communicate those needs to the data processing personnel so that both clearly understand what is desired. They report the finding that most computer systems achieve less than fifty percent of managerial objectives; they

believe that this is primarily due to a lack of ability of operating managers to communicate needs to data processing personnel.

The MSIS training program was designed to address the problems cited above. There were large differences among potential trainees' knowledge of data processing in general and MSIS specifically. Recognition of these differences led to a step-by-step training design beginning with a brief data processing orientation, a general orientation to MSIS and the context in which it was developed, and the specifics of MSIS use. Since both technical and non-technical personnel would participate in training sessions, it was felt that the training would facilitate the kinds of communication suggested to be needed by McConnell and Setaro.

Training Strategies

In developing a theory for teaching (training), Rath and McAuliffe (1974) identify several strategies commonly used: one-to-one, one-to-many and many-to-many, as well as mechanical aids for learning. One-to-one teaching includes individualized instruction such as tutoring and counseling, as well as the individual interactions between teacher and learner. One-to-many is the traditional model of instruction through lecture, and also includes the laboratory method in which several students are supervised by one instructor. Many-to-many is found in team-taught classes or seminars where several instructors interact with a group of students. There are advantages and disadvantages to each of the strategies. The one-to-one model is extremely expensive and may involve a waste of resources. The one-to-many is cheaper, but is often unsatisfactory to the learner because there is little opportunity for individual needs to be met and transfer of learning from the classroom to the job is less effective.

The team approach (many-to-many) adds scope to the learning process, increases communication and feedback between teacher and learner, provides flexibility and ease of teacher substitution, reduces fatigue of the instructor and adds variety for the learner. However, the team approach is more costly than the one-to-many model, and adds the complication of relations within the team. Recently, many organizations have recognized the value of team training, and have implemented programs to help the teams develop skills in decision making and conflict resolution with the end result of more effective functioning (Bergquist and Phillips, 1975).

The team approach was mandated as most appropriate for the MSIS training in the States and Regions, due to the extended length of time over which training would take place (18 to 24

months), the length of the training itself (5 full days), and the depth of the training (MSIS is a large, complex computer system). Recognition of the potential problems of this approach led SWORCC to again utilize the expertise available through the Faculty Resource Center to design training for the trainers. This training was to include not only teaching/learning theory and process, but components of planning, decision making, conflict resolution, and team development. The team approach was seen as critical to the training process. The flexibility, the support offered individual trainers, the built-in evaluation component, and the ability to react quickly in an ever-changing environment offered by the team approach were seen as crucial to success. A consultant worked with each team during the early phases of training, including on-site consulting during actual State and Regional training.

The Training Team As An Open System

Small groups such as a training team may be viewed as demonstrating the characteristics of open systems (Miller and Rice, 1967). They have clear boundaries; they interact with their environments; the members are goal-oriented and interdependent; and resources are input from the environment, acted upon, and returned to the environment. Accurate feedback about performance is critical to positive change in any system. With timely and accurate feedback, corrective action may be taken when the system is off target and continual improvement will be assured.

In discussing instructional evaluation as a means of providing feedback to an instructor, Bergquist and Phillips (1975) describe three methods used to assess the discrepancy of current operations and desired outcomes: self-evaluation, peer evaluation, and student evaluation. Self-evaluation calls upon the instructors to assess their own strengths and weaknesses, often comparing self-ratings with judgments made by others. Discrepancies may become the focus of a program designed to improve performance. Student evaluation is the most commonly used method of evaluating performance, but has several drawbacks: the instructor may rationalize negative evaluations; the usefulness of the information gathered may be questionable; and it provides only one viewpoint. Peer evaluation is seldom found in instructional programs, primarily because of shortage of time and lack of trust. Ideally, peer observers should receive interpersonal skills training in order to provide feedback in a manner which will not bring about defensiveness on the part of the instructor.

The MSIS training teams were designed as self-correcting systems. Not only were evaluations solicited from participants during the training process, but the structure of the teams was designed to incorporate objective, peer evaluation. Each team was composed of members filling three distinct roles:

Team Leader: Served as a major presenter of content and as the administrator and leader for the team.

Associate Presenter: Served as a presenter, and was responsible for some administrative duties.

Observer: Was responsible for all evaluation activities, including detailed observation and critique of training presentations and activities, but was not an active part of the presenting process.

The role of observer was included in the team structure to provide objective information about strengths and weaknesses in the training process. Daily and lengthy debriefings of the team permitted objective feedback to the presenters and allowed for immediate changes to the curriculum or training process, as required for the next day's training. The observer helped the presenters to increase their skills in technical areas such as content clarity, question and answer cycles, use of audio-visual aids and notes, voice clarity, eliciting understanding and involvement, and balance in presentations, as well as in group process skills. The latter skills included awareness of dynamics of the audience, criticism, role clarification, and control of the training environment. When possible, debriefings of the entire week's training were held with SWORCC management personnel and both teams present to facilitate shared learning and improvement of training through exchange of experiences and cross-fertilization of ideas. Thus the observer role, as an integral part of the team structure, provided the input necessary for continuous improvement in performance.

An awareness of the importance of the training team's role in establishing an alliance to maximize learning (Epperson, 1974) led to intensive training for the trainers. Because many components of this training were unique, it is described in some detail below.

TRAINING THE TRAINING TEAMS

A training program for the trainers in the MSIS project was designed by four University of Cincinnati Faculty Resource Center consultants to accomplish several major training and development goals. These goals were to: (1) develop and build effective and skilled working teams, (2) present and use teaching/learning theory and process, and (3) develop and implement a team action plan to master MSIS technical and informational data, team roles, and process. The training program was divided into three major phases: (1) Phase I (May 20-22, 1977) was a week-end workshop for all MSIS Water Team personnel, designed as a "kick-off" for the project, with the specific goal of beginning the process of team building; (2) Phase II (May 23 - September 1, 1977) was a three-

month period which allowed each team to develop and work independently, and which overlapped with some actual training of State personnel by the MSIS Water Teams in July and August; and (3) Phase III (September, 1977 - June, 1978), a ten-month period of training delivery which also allowed for any further training that was deemed necessary.

Phase I (May 20-22, 1977)

A week-end workshop was attended by the two Water Teams and a third team composed of MSIS project management personnel. The inclusion of this third team was the key to developing management support and understanding of the training process - its members were the Project Director, the Director of Contract Services and the Director of SWORCC (three levels of management above the team leader). The greatest emphasis during this phase was on team development. The rationale for this emphasis was that once a solid working relationship existed between team members, the team would effectively work to develop a plan to master the MSIS material and to undergo the necessary practice teaching sessions prior to actual training in the field.

The general flow of activity in the workshop consisted of a short lecturette - about 15 minutes - followed by a group activity based on the theory covered in the lecturette. In general, day one was devoted to the development of trust and the acquisition of communication, observation, and feedback skills (constructive criticism). The evening was devoted to intensive self-examination using the Life Orientation (LIFO) instrument (Lifo Associates, 1973). This instrument helps individuals understand their specific strengths and weaknesses in relation to leadership style and interpersonal functioning under both normal and stress conditions.

On day two, the LIFO exercise was used to further develop team trust through discussion of individual LIFO results and some examination of a team composite. The remainder of this day emphasized team skills and roles, and individual team functioning. At this point, each team initiated plans to master the MSIS training material and discussed team roles.

One of the workshop trainers was assigned to each team to aid in the development of the team plan, to assist presenters to achieve excellent presentation skills, to help in the creation of a detailed five-day course design for future implementation in each State, and to be responsible for the continued process of team building.

Phase II (May 23 - September 1, 1977)

Phase II contained several activities designed to further team development and content mastery. These activities included a 3-

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day workshop immediately following Phase I which was devoted to teaching/learning theory and process, and a series of practice presentations given by the team (a workshop involving MSIS data processing personnel, a joint State presentation (Oklahoma) by the teams, individual team presentations at Regional Environmental Protection Agency meetings, and the training of the first State). The practice sessions were designed to increasingly mirror the realities of the teaching/learning environment which the teams would experience in the field.

During this period, the teams were assigned specific tasks by the organization and the training consultants. Major emphasis was on the development of a week-long training course for State water personnel, mastery of the general and technical information on the MSIS computer system, and delivery of the initial training session for Oklahoma State personnel. Critical to this process was the ongoing practice of team development concepts presented in the Phase I workshop, and the examination of team issues with the training consultants. Again, the notion was the development of a strong team concept seen as necessary for successful operation in a highly political and stressful environment over a lengthy period of time (18 to 24 months).

The team presenters were expected to develop and practice teaching skills by conducting formal presentation sessions, utilizing the other two team members as observers in the Peer Observation Process.* The team observers were expected to support the presenters in developing and practicing teaching skills and to be responsible for facilitating the Peer Observation Process. The teams were expected to further refine and implement their plans to reach the specific goals which were formulated during Phase I. The teams were expected to meet with their training consultant on a regular basis for formal and informal training sessions and team meetings.

Each of the two teams, as expected, developed at a different pace. Bales (1950) described the two major categories of activities necessary for small groups to function effectively over time as being those related to task (instrumental) and those related to interpersonal relations or team maintenance (expressive). These issues, while similar in nature for each of the teams, appeared at different times during Phase II. Cycles of relative emphasis on task or maintenance issues were quite different for each team. Figure 1 has been included to describe whether the task or maintenance issue was the focus of attention for each team at various times during Phase II.

* Modeled after a process used by /I/D/E/A, the educational affiliate of the Charles F. Kettering Foundation, Yellow Springs, Ohio.

Figure 1: Relative Emphasis on Task or Maintenance Activities of Training Teams During Phase II.

Figure 1

Event	Team 1	Team 2
Workshop Following Phase I	Tm	Mt
MSIS Data Processing Workshop	Tm	Mt
Oklahoma Presentation	Mt	Tm
Regional EPA Meeting	Tm	Tm
First State	Tm	Tm
Sept. 1, 1977 (Phase III)	Mt	Tm

This table represents the emphasis placed by the teams on task or team maintenance activities in Phase II. Each team had a primary focus on one or the other issue, indicated by the capital letters T (task) or M (maintenance). The secondary focus is shown by a small t or m. (Source: Training Team Consultants)

Team 1 focused primarily on task-related activities such as content mastery, presentation methods, and training design during the early period of Phase II, while Team 2 was resolving leadership issues and team roles. As shown by Figure I, these maintenance issues, once resolved, allowed Team 2 to focus on task activities, while Team 1 was periodically dealing with unresolved team dynamics. The ratio of time spent on task focus was 2/1 for both teams, and at the end of Phase II, the goals of content mastery and presentation skill had been achieved by both. The teams were effective and skilled working units.

It should be noted that the maintenance issue must be dealt with fully before a team can develop the trust and openness necessary to implement continuing improvement utilizing the objective observer. If resolutions of maintenance issues had not eventually occurred in each team, an intervention would have been made.

MSIS TRAINING IN THE FIELD (Phase III)

Phase III (September, 1977 - June, 1978) included the bulk of MSIS training. A five-day training program was conducted by the training teams in twenty-five States during this period. This section of the report describes the characteristics of the trainees, the restructuring of the training teams with particular emphasis on the importance of the observer role, and the management/team interface during this period of training.

Characteristics of the Trainees

A total of 417 persons attended some part of the training offered, with 255 completing the entire course of instruction. The trainees ranged in age from 19 to 62, and included 193 males and 72 females. The positions held by the trainees were: 45 managers, 47 professionals, 115 technical specialists, 38 clerical, and 12 enforcement officers.

The "average" trainee was a 34-year-old male with a college degree in a technical area (e.g., civil engineering). He had been employed in his current job for 32 months, and had 7.5 years of experience in his general area of employment. At the start of training, he had only a little or some knowledge of data processing, and only some knowledge of the Federal Drinking Water Regulations.

Restructuring the Training Teams

At the end of Phase II, several members of the original training teams had been reassigned to other aspects of the MSIS project, by either personal choice or organizational necessity. This high change of personnel is typical in many data processing organizations. During Phase III, therefore, training of the trainers was devoted to adjustment to membership changes within the teams. The team leaders continued to perform their roles throughout this period, which provided continuity; however, they also had the added responsibility of maintaining the quality of the program with changing co-presenters and observers.

Three new co-presenters were selected during this phase. One had served as an observer on an original training team, and all had extensive knowledge of MSIS. The new team members accompanied training teams as an additional team member to at least one State presentation, and gradually worked into taking responsibility for a greater role in the presentation of content. The observers provided the necessary feedback to help the new presenters achieve the quality level of performance required.

In this phase of training, it was recognized that effective observers needed extensive training in group process, feedback, observation skills, etc. As a consequence, two of the original consultants were made permanent observers to accompany teams delivering the training program to States and Regions.

The original notion of a team as a relatively stable unit was replaced by the concept of "temporary systems" (Bennis and Slater, 1968) in which accurate feedback became even more important. Any new combination of team leader and co-presenter was seen as requiring feedback which could only be given by someone not involved in the process of instruction. Daily debriefings continued to be held, using the pre- and post-test information, participant evaluations, and, most importantly, the observer's detailed notes of activities which happened during the day. The focus of the debriefings was to examine what was going well and what could go better, in order to determine how to enhance the former and improve the latter.

The highly political and stressful environment of States and Regions in which the training was presented made it imperative that problems encountered be dealt with immediately, effectively, and professionally. This need was further emphasized by the great diversity in both philosophy regarding State/federal relationships and local environment regarding the State of readiness for training (data processing expertise, managerial readiness for MSIS implementation, staffing, State emphasis on water management, etc.) The end result was that teams had to be extremely flexible, have definitive and unbiased data on which to act, and have an inherent ability to assimilate and act rationally on the data in real time. The observer role was key to the adaptive process.

The necessity of change in team members during the period of the training, which was at first viewed as a problem, resulted in several positive outcomes: presenters were exposed to different and innovative methods of teaching, feedback was received from another highly skilled observer, and the opportunity to share previous experiences was enhanced. Finally, planning for change increased the effectiveness of the training teams in the field by further developing a climate of trust and support.

Management/Team Interface

In a complex and changing environment, a flat or decentralized organization is generally recognized as superior to the tall or heirarchical organization, because decisions need to be made as closely as possible to where the action occurs (Galbraith, 1973). The training teams operated in such an environment, and were consequently granted a great deal of autonomy in deciding how best to deal with situations arising in the field. Such autonomy obviously presupposes highly developed team skills - shared

decision making, planning, clarity of team roles, communication, trust, awareness of group process, and so forth.

As previously mentioned, learnings in the States were brought home as well. Whenever possible the teams had joint debriefings at the end of State visits, where helpful information was shared with the other team and with management. A number of ideas for content changes and better teaching techniques arose from such debriefings, often as the result of suggestions from observers. In addition, problems were discussed with an eye toward prevention in future State training visits. An example would be the observation during several water training trips earlier in the year that a small, crowded room seemed to enforce physical and psychological constraints which had a negative impact on the quality of instruction. Consequently, a point was made to use the pre-management conference held between ODW, SWORCC and State management personnel as an occasion to inspect the facilities to be used (where possible) and to insist upon adequate facilities. These debriefings had the additional purpose of keeping management involved in the on-going training process. The need for new resources, the development of new training materials, and information exchange facilitated planning for subsequent State visits.

EVALUATION OF THE MSIS TRAINING PROCESS

Goldstein (1974) has cited the lack of adequate evaluation as the major weakness found in training programs. In addition to the previously mentioned participant evaluation of daily activities and of the overall training, tests covering the desired mastery of MSIS information and skills were administered prior to and following the presentation of each of the four units: MSIS Overview, Subsystems, Data Entry, and Selection Process. Finally, instruments were developed to monitor the feelings of the team members concerning themselves, their roles, and team functioning. (Examples of all instruments are contained in Appendix II.) The results and discussion of an analysis of the data collected through the evaluation process are presented below and in Appendix I as trainee evaluation and trainer data.

Trainee Evaluation

Two methods were used to assess trainee learning in the MSIS training: subjective ratings of self-knowledge of MSIS and quality of training, and objective performance on pre- and post-tests of the material covered in the training. Additional analysis was done to determine the influence of a variety of factors affecting ratings and test scores.

Subjective Ratings

At the completion of each pre- and post-test, participants were asked to rate their knowledge of MSIS at that moment. The results of these self-ratings are shown in Table 1. Self-ratings of MSIS knowledge increased from pre-test to the time the post-test was completed for all four parts of the training. The low initial self-ratings of knowledge of MSIS were probably due to the fact that little information on the system and the federal water regulations was available to participants prior to training. The higher initial ratings on Parts 2, 3, and 4 could have been the result of prior knowledge of data processing in general, with consequent transfer of components which are common to all systems, e.g. keypunch instructions. Thus the greatest gain was seen in the knowledge specific to MSIS. It is highly probable that the self-ratings of MSIS knowledge on the post-tests are on the conservative side because participants could not expect to master such a complex system in a five-day period.

Table 1. Participants' Average Self-Ratings of MSIS Knowledge Prior to and at End of Training*

Part	Prior to Training	End of Training	Change	Number of Respondents
1. MSIS Overview	1.936	2.659	+ 0.723	(264)
2. MSIS Subsystems	2.215	2.555	+ 0.340	(247)
3. Data Entry	2.448	2.599	+ 0.151	(212)
4. Selection Process	2.515	2.834	+ 0.319	(163)

* Ratings based on a 5-point scale with 1 = none, 2 = a little, 3 = some, 4 = quite a bit, and 5 = a great deal.

An attempt was made to have the trainees in each State rate at least one of the presentations and one of the workshops during the training period. The workshops and presentations were not chosen randomly, but were selected to give the trainers specific feedback about a particular part of the training. The average workshop evaluation for 327 responses was 5.0 on a six-point scale where "1" was a highly negative rating and "6" was a highly positive one. The average presentation evaluation score for 461 responses was 5.2, also on a 6-point scale. It is felt that these very positive ratings indicate a high degree of success achieved in training the trainers in teaching/learning processes.

At the end of each course the trainees were asked to complete a final evaluation questionnaire. In the area of curriculum, they were first asked to indicate whether the amount of information presented on a variety of subjects was too much, too little, or about right. The responses to these items are summarized in Table 2. In general, the responses to the final item, "Training Summary", are representative of responses to individual items: 10% believed that too little information was presented, 2% believed that too much information was presented, while 88% believed that the amount of information presented was about right. These data certainly indicate a high degree of participant satisfaction with the training.

However, some problems were noted. Twenty percent or more of the respondents believed that too little information was presented on "Documentation", the "Record Creation and Maintenance Input Form", the "Water Quality Transaction Input Form", and "Output Reports". Still, with the exception of "Cutput Reports", more than 70% of the respondents indicated that the amount of information presented in these areas was about right. It is interesting to note that the areas participants indicated as having too little information are those which must be mastered to operate the system. Much of this knowledge can only be achieved by use of the system with actual data. Despite the fact that these areas were emphasized to the maximum degree possible, trainees continued to express dissatisfaction with the amount of information received.

In the final evaluation questionnaire trainees were also asked to indicate how satisfied they were with the amount of material presented by three modes of instruction: lecture, workshops, and informal discussion. These data, shown in Table 3, indicate a high degree of satisfaction with the amount of information presented by lecture, and a moderate to high degree of satisfaction with the amount of information presented during informal discussions. On the other hand, 33% of the respondents thought that too little information was presented by workshops.

The workshops simulated actual on-the-job occurrences, and were used to give participants practical application of the information presented. As the training progressed, additional workshops were developed to meet participant needs, but again with little change in participant response; i.e., more workshops were desired.

Table 2. Percentage Distribution for Trainee Satisfaction With Amount of Information Presented, By Subject

Subject	Response (%)			Number of Respondents*
	Too little	Too much	About right	
National Safe Drinking Water Act	12	18	70	(233)
Federal Regulation	14	16	70	(235)
Subsystem Function	1	4	84	(238)
Files	12	6	82	(239)
Tables	11	10	79	(239)
Documentation	23	6	71	(185)
Table Creation Input Form	12	5	83	(186)
Record Creation and Maintenance Input Form	22	4	74	(186)
Water Quality Transaction Input Form	20	4	76	(184)
Output Reports	39	4	57	(234)
Selection Process				
PROC	15	4	81	(183)
SORT	12	3	85	(180)
SEL1 and SEL2	13	3	84	(179)
SRVY	15	5	80	(182)
Training Summary	10	2	88	(171)

* The large variation in the number of responses occurred because some items were not included in the early version of the questionnaire.

Table 3. Percentage Distribution for Trainee Satisfaction With Amount of Information By Instruction Mode

Instruction mode	Response (%)			
	Too little	Too much	About right	Number of Respondents
Lecture	1	13	86	(242)
Workshop	33	4	63	(242)
Informal discussion	16	6	78	(194)*

* This item was not included in the early version of the questionnaire.

In addition to being requested to rate one or two specific workshops and presentations during the training, the trainees were asked on the final evaluation questionnaire to give overall ratings for the workshops and presentations. The average ratings obtained were 5.1 for the workshops, 5.4 for the presentations, and 5.0 for the entire training, again based on a 1-6 point scale in which "6" was a highly positive response.

The remainder of the fixed-response items on the final evaluation were included under the heading "Other Evaluation". The responses to these items are summarized in Table 4. The most important finding indicated in Table 4 is that, at the completion of the training, the respondents were only in slight agreement with the Statement "I know enough about MSIS to do my job". This finding is consistent with the data presented in Table 1 which show that both pre-test and post-test self-ratings of MSIS knowledge were quite low. The complexity of the system, the uncertainty of expectations on the job, and the desire for more training indicated by responses to questions 1 and 2 tend to explain the lack of self-confidence shown by the participants.

Objective Performance

A pre- and post-test were administered for each of the four parts of the MSIS training. This design is considered superior for evaluating field research programs in which true experimental control is not possible (Campbell and Stanley, 1963). These tests measured the trainees' knowledge prior to and after completion of training in each area. Table 5 shows the average percent of correct responses on each test for all four parts, and the percentage increase in correct responses from pre- to post-test. Substantial increases in MSIS knowledge are shown for each of the four parts of the training. These increases indicate the actual increase in participants' knowledge of information about the MSIS system, and are highly positive indicators of the success of the training. It is interesting to compare the objective results with the subjective self-rating of the trainees.

Tables 6 and 7 show the pre-test and post-test deviation scores and percentage of correct responses by State for Parts 2 and 4, respectively. It is clear that even though there was significant deviation in post-test scores among States, this deviation was very small compared to the deviation in pre-test scores between States.

Table 4. Participants' Average Ratings For Six Items Included Under Heading of "Other Evaluation"

Item	Rating*	Number of Respondents
1. The length of the Water Training should be increased.	3.86	(186)
2. I need more training from SWORCC personnel in some areas.	4.44	(184)
3. There was too much dependency on the use of 35 millimeter slides.	2.00	(188)
4. I liked it when the presenters were informal.	5.43	(188)
5. There was too much dependency on the use of newsprint.	2.13	(188)
6. I know enough about MSIS to do my job.	4.08	(186)

* Ratings are based on a 6-point scale where 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree, and 6 = strongly agree.

Table 5. Participants' Average Percent of Correct Responses on Pre-tests and Post-tests For MSIS Training In 27 States

Part	Pre-test %	Post-test %	Change %	N
1. MSIS Overview	64.8	88.0	+ 23.2	279
2. MSIS Subsystems	53.5	77.9	+ 24.4	256
3. Data Entry	69.5	79.3	+ 9.8	218
4. Selection Process	55.8	81.8	+ 26.0	171

Table 6. Part 2 Pre-test and Post-test Percentage of Correct Responses and Deviation Scores by State

State	Number of Respondents	Pre-test % of Correct Responses	Pre-Test % of Deviation from Overall Average	Post-test % of Correct Responses	Post-test % of Deviation from Overall Average
1	12	72.85	19.35	77.13	-0.77
2	10	75.94	22.44	83.17	5.27
3	6	73.44	19.94	83.97	6.07
4	13	72.17	18.67	86.81	8.91
5	12	73.94	20.44	77.88	-0.02
6	12	60.94	7.44	84.05	6.15
7	17	24.64	-28.86	73.85	-4.05
8	7	50.22	-3.28	69.11	-8.79
9	9	45.27	-8.23	69.74	-8.16
10	5	46.14	-7.36	79.97	2.07
11	15	43.67	-9.83	73.03	-4.87
12	18	50.33	-3.17	82.52	4.62
13	13	63.71	10.21	76.04	-1.86
14	9	67.05	13.55	78.19	0.29
15	12	54.27	0.77	79.63	1.73
16	8	51.44	-2.06	75.97	-1.93
17	5	35.34	-18.16	82.97	5.07
18	10	36.14	-17.36	70.87	-7.03
19	10	60.84	7.34	79.97	2.07
20	10	39.14	-14.36	75.17	-2.73
21	4	40.19	-13.31	76.97	-0.93
22	12	56.27	2.77	84.30	6.40
23	7	38.37	-15.13	56.11	-21.79
24	4	60.94	7.44	89.97	12.07
25	8	56.44	2.94	80.97	3.07
26	8	32.94	-20.56	76.47	-1.43

Overall Average Percent of Correct Responses = 53.5

Hi = 75.94 (State 2)
Lo = 24.64 (State 7)
Range = 51.30

= 77.9

Hi = 89.97 (State 24)
Lo = 56.11 (State 23)
33.86

Table 7. Part 4 Pre-test and Post-test Percentage of Correct Responses and Deviation Scores by State

State	Number of Respondents	% Correct	Pre-test Deviation Scores	% Correct	Post-test Deviation Scores
1	8	71.1	15.30	75.98	-5.82
2	9	68.09	12.29	79.64	-2.16
3	5	57.78	1.98	77.38	-4.42
4	13	67.82	12.02	83.28	1.48
5	11	53.16	-2.64	81.25	-0.55
6	10	35.88	-19.92	76.78	-5.02
7	6	46.31	-9.49	74.81	-6.99
8	5	67.38	11.58	84.38	2.58
9	4	76.48	20.68	89.48	7.68
10	3	57.64	1.84	87.31	5.51
11	9	56.20	0.40	79.31	-2.49
12	12	61.89	6.09	78.98	-2.82
13	11	40.07	-15.73	83.61	1.81
14	6	35.98	-19.82	83.31	1.51
15	6	36.14	-19.66	84.14	2.34
16	1	31.98	-23.82	57.98	-23.82
17	9	63.64	7.84	82.42	0.62
18	5	50.58	-5.22	76.78	-5.02
19	13	62.34	6.54	86.13	4.33
20	5	57.78	1.98	88.38	6.58
21	3	52.64	-3.16	91.31	9.51
22	9	61.86	6.06	85.31	3.51
23	8	44.73	-11.07	82.88	1.08

Overall Average Percent of Correct Responses	= 55.8	= 81.8
	Hi = 76.48 (State 9)	Hi = 91.31 (State 21)
	Lo = 31.98 (State 16)	Lo = 57.98 (State 16)
Range	44.50	33.33

On Part 2 the pre-test percentage of correct answers by State ranged from 28.86% lower than the overall average of 53.5% correct answers to 22.44% above the average. In comparison, the range of post-test percentage of correct answers ranged from 21.79% below the overall average of 77.9% correct to 12.07% above the average. If the extreme shown by State 23 is not considered, the smaller amount of deviation between States is even more clearly shown. Of particular importance, however, is the substantial increase in the percentage of correct responses shown by all States. Similar results are shown for Part 4.*

The pre-test scores indicate the great variation between States with which the training teams had to cope. It is to their credit that the training was so effective in smoothing out the differences.

Thus, while participants rated their own knowledge of MSIS very low at the start of training and only somewhat higher at the end, they were very satisfied with the information presented and the teaching strategies employed by the training teams. A need for further training was expressed. Most importantly, there is objective data which indicates the high degree of success the MSIS training had in conveying the information needed by State and Regional personnel to operate the system.

* Additional statistical analyses of final evaluation ratings, post-test scores, and trainer data are presented in Appendix I.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

MSIS training was developed by SWORCC to enhance the learning of adult trainees in a variety of geographic and political environments. The extended period in which training was to take place necessitated a team approach to training, with the concurrent need to concentrate early training of the teams in communication skills, effective feedback, and interpersonal trust in order to maintain high quality presentations. The inclusion of the observer role was seen as a key to continuous improvement of the training because it made available immediate and objective criticism of performance.

The major goal of the MSIS training was to increase the knowledge of State and Regional trainees about the use of a complex computerized management system. All evaluation instruments indicate a high degree of success in meeting this goal. Self-ratings of knowledge increased for all parts of the training, as did objective scores on post-tests when compared to pre-tests administered during the training. An additional indicator of the success of the training process was the very high ratings of the training by the participants. Thus, the success of the training was shown by both objective and subjective measures. The training goals were met.

Recommendations

1. The introduction of new management systems should always include a training component for both management and data processing personnel to ensure appropriate understanding on the part of users and to minimize waste of resources.

2. The team approach allows maximum performance over an extended period of time. Team development is crucial to this process and must be included in training of the trainers.

3. The observer role should be seen as the key to high quality training. The special skills needed to fulfill this role are not easily learned, but are seen as crucial for continuous improvement in performance.

4. Although a concentrated training program can greatly enhance the knowledge of trainees, it must be recognized that additional resources must be available to provide follow-up training as actual usage of the system takes place.

5. The use of the concept of "temporary systems" is the most viable when dealing with a lengthy training process in which changes will necessarily occur.

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APPENDIX I

DESCRIPTION OF CONTENTS

This is Appendix I to the Final Report B, MSIS Training, dated 1979.

Additional statistical analyses were done to evaluate factors which might have influenced final evaluation ratings and post-test scores. In addition, information was gathered from team members over the period of training. The results are presented in this appendix.

Factors Influencing Evaluation Ratings and Post-test Scores

Table 1 presents the results of a hierarchical regression analysis of factors which could have influenced the final evaluation ratings of trainees for the presentations, the workshops, and the overall training. Background factors such as age were first entered, followed by team and training order. As indicated by Table 1, education had significant (over .05) correlation for all three ratings, and knowledge of federal regulations was significant for Presentation and Overall scales. Neither Team nor Training Order predicted final evaluation ratings, nor did any of the background variables with the two exceptions noted.

Factors which could influence post-test scores were also evaluated using multiple regression analyses. Three sets of variables were included: (a) background variables; (b) pre-test scores; and (c) trainers (See Table 2). Regression analyses were done for post-test scores for each of the four parts of the training.

As Table 2 indicates, the background variables were rather consistent in accounting for 17 to 18 percent of the score variance in all four post-tests. In general, the best predictor of post-test scores among the background variables was the self-rating of data processing knowledge (Beta = .247, .319, .311, and .262 for Parts 1 through 4, respectively). Initially, education level was a good predictor of post-test performance (Beta = .352 in Part 1 and .286 in Part 2); but it was not a significant factor in succeeding parts. Age, on the other hand, was not significant initially, but reached significance in Part 4 (Beta = -.367). Age had a negative association with post-test scores, meaning that with all other background factors controlled, younger people scored higher on the Part 4 post-test than older people. None of the other background variables were significant predictors of post-test scores.

The influence of pre-test scores declined in each succeeding part of the training from a Beta of .562 for Part 1 to a Beta of .189 for Part 4. Pre-test scores were the best predictors of post-test scores for Parts 1, 2, and 3. It is interesting that two indicators of initial advantage, education level and pre-test scores, became less important predictors as the training progressed throughout the week; while a third indicator, data processing knowledge, was a substantial predictor throughout the week's training.

There were no differences in post-test scores as a function of which team did the training. The low Beta weights obtained for the team variable indicate that when background and pre-test variables were held constant, post-test scores were nearly identical for both teams. There was, however, evidence of a slight effect for Training Order. With background and pre-test variables held constant, Part 1 and Part 3 post-test scores tended to drop over time while Part 4 post-test scores tended to rise for

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states trained in the latter part of Phase III. There was no effect on Part 2 post-test scores.

Overall, the total set of metric explanatory variables (age, years, education, etc.) in linear combination accounted for 44.9 percent, 34.4 percent, 32.0 percent, and 24.7 percent of the variance in post-test scores on Parts 1 through 4, respectively. Post-test scores were less determined by these variables as the training progressed throughout the 18 months it was conducted.

Trainer Data

Trainer data consisted of responses to three questionnaires (See Tables 3, 4, and 7). Table 3 shows results of the Role Questionnaire, Table 4 presents results of the Team Questionnaire, and Table 7 gives the results of the Self Questionnaire. Each questionnaire consisted of 10 or 11 statements to which the respondent was to give a rating between "1" and "6", where "1" was "strongly disagree" and "6" was "strongly agree". Trainers were requested to complete a set of questionnaires within one week following each training session. In all, 70 sets of questionnaires were obtained - 29 from Team 1 and 41 from Team 2. There was a very even distribution between Team Leaders (23 sets), Team Members (23 sets), and Observers (21 sets).

Role Questionnaire

Item means and standard deviations for the Role Questionnaire are shown in Table 3. Items 1, 2, 6, and 8 did not have sufficient variance to be included in the Role Scale. All responses were either "5" or "6" to items 1, 2, and 8, which only three responses were less than a "5" on item 6. Thus, these items did not discriminate sufficiently between individuals to be useful from a measurement viewpoint. Item 10 had a bipolar response pattern (16 responses "1" or "2" and 43 responses "5" or "6"). This item clearly differentiated between observers and trainers, with the average response being 2.65 for observers and 5.29 for trainers. Item 10 did not fit into the factor structure with the remaining items because of this bipolar response pattern. The remaining items (3, 4, 5, 7, and 9) were used to form the Role scale, which had a verh high reliability (.892).

As already indicated, item 10 of the Role Questionnaire discriminated between observers and trainers. We were interested in whether the Role Scale also differentiated between Observers, Team Leaders, and Team Members; and between Teams 1 and 2. An analysis of variance technique was used to answer this question, and it was found that neither Team nor Position had a significant effect on Role Scale responses.

The very high scores on the Role Questionnaire are an indication of the effectiveness of SWORCC management's emphasis on role clarification during the training of the trainers.

Team Questionnaire

All of the Team Questionnaire items had sufficient variance (Table 4) to be considered in the Team Scale construction. The factor analysis of the Team Questionnaire revealed the existence of two item clusters: items 1, 3, 5, 7, 8, 9, and 11; and items 2, 6, and 10. Item 4 stood by itself. The responses to items 2, 4, and 10 suggest that these were seen as negative factors in team membership. Item 6 had a bipolar response pattern with 37 responses either "1" or "2" and 28 responses either "4" or "5." Items 1, 3, 5, 7, 8, 9, and 11 constituted a positive item cluster; and this combination of items had a high reliability (.866). The cluster of items 2, 6, and 10 had a low reliability of .574 and was dropped. As a result, we had one Team scale which was composed of the seven items in the positive item cluster.

As indicated in Table 5, there were significant effects for both Team and Position of the Team Scale ratings. Team 2's average rating was lower than the average rating for the two teams combined, while Team 1's was higher. Observers had a lower rating than the average for all Team Members combined, while Team Leaders and other Team Members' averages were higher.

Item 2, competitiveness, showed effects for both Team and Position (Table 6). Team 2 members rated themselves as more competitive than did Team 1 members. There was a large difference between Team Leaders and Team Members on the competitiveness item, with Team Leaders scoring lower. Observers were between the two extremes. Table 6 indicates a similar effect for Position on item 6, aggressiveness, with Team Leaders having a low rating compared to Team Members, and Observers again being between the extremes. On perceived influence, item 4, there was also a significant Position effect; but here it was the Observers who felt they had less influence relative to the Team Leaders, while Team Members occupied a position between (Table 6). Recall that item 4 has a negative wording, so a higher rating indicates less influence. Item 10, self disclosure, showed no Position or Team effects.

Self Questionnaire

Means and standard deviations for the Self Questionnaire items are shown in Table 7. Items 1, 2, 3, and 8 had insufficient variation for measurement purposes, with only 2 or 3 responses for each item being less than "5". Literally all of the trainers and observers believed that they worked well with people, were satisfied with their work performance, communicated well with others, and were involved in the MSIS training. The remaining items factored into two clusters. Items 9 and 10 formed one cluster with a high reliability (.890). Items 4, 5, 6, and 7 formed a cluster with a low reliability (.644). Only items 9 and 10 had sufficient reliability when combined as a single scale. Both items related to perceived knowledge about MSIS. Therefore, the Self Scale was composed of only items 9 and 10; it should be remembered this scale measures only self-evaluation of MSIS

knowledge. Items 4, 5, 6, and 7 did not have enough variability to serve as single item scales, so analyses of the Self Questionnaire were restricted to the Self Scale (MSIS knowledge). As indicated in Table 8, there were significant effects for both Team and Position on Self Scale ratings. Team 1 had a higher average rating than Team 2; and Team leaders and Team Members had significantly higher ratings than observers. Since observers were not responsible for content, this is not surprising.

Appendix I - Table 1. Results of Hierarchical Regression Analyses For Final Evaluation Scales (Number of Respondents=139)

Variable	Criterion Scale		
	Presentation	Workshop	Overall
	Beta**		
A. Step One - Background:			
Age in years	.218	.155	.165
Sex	-.068	.060	.020
Education	-.351*	-.342*	-.238*
Months in present position	.089	.050	-.013
Years experience genl. areas pres. position	-.143	-.185	-.106
Have received tng. in present position?	.071	.011	.113
Current knowledge of data processing?	.051	-.008	-.031
Knowledge of fed. drinking water regs?	.274*	.183	.257*
B. Step Two - Trainers:			
Team	.093	-.110	-.156
Training Order	.013	.091	.031
A. #R^2 for Background Variables	.168	.146	.113
B. #R^2 for All Variables	.184	.168	.137

* $P < .05$ - indicates statistical significance at the stated level of probability

** Correlation between predictor variable and final evaluation scales.

\# Amount of variation in final evaluation scales explained by each group of variables entered into analyses.

Appendix I - Table 2. Results of Hierarchical Regression Analyses For Post-test Scores

Variable	Number of Respondents	Beta*** MSIS Overview (168)	MSIS Subsystems (173)	Data Entry (143)	Selection Process (126)
A. Step One - Background:					
Educational Level		.352**	.268**	.163	.013
Data Processing Knowledge		.247**	.319**	.311**	.262**
Knowledge of Federal Regulations		.085	-.094	-.013	.015
Sex		.084	.166	-.016	.085
Time in Present Position		-.050	-.172*	-.091	-.054
Training in Present Position		.-38	.055	.058	.032
Age		-.075	-.002	-.102	-.367**
Total Years Experience		.068	.043	.025	.172
B. Step 2 - Pre-test Scores:		.562**	.452**	.357**	.189*
C. Step 3 - Trainers:					
Training Order		-.195*	-.016	-.206*	.207*
Team		-.112	-.043	.037	.009
A. #R^2 for Background Variables		.177	.176	.166	.181
B. #R^2 for Background and Pre-test		.418	.342	.275	.208
C. #R^2 for All Variables		.449	.344	.320	.247

* $P < .05$
** $P < .01$
- indicates statistical significance at the stated level of probability.
*** Correlation between predictor variable and post-test scores.
\# Amount of variation in post-test scores explained by each group of variables entered into analyses.

Appendix I - Table 3. Average Rating and Standard Deviations for Role Questionnaire Items (Training Team Data)

	Item	Average Rating	Standard Deviation
1.	The rationale for the existence of my role is clear to me.	5.89	0.312
2.	It is evident to me how my role helps achieve the overall goals of the MSIS Training Program.	5.89	0.312
3.	The specific duties and behaviors of my role are clear to me.	5.48	0.868
4.	I am aware of the expectations of the other team members concerning my role.	5.12	0.893
5.	I am clear about my expectations for the other team roles.	5.65	0.648
6.	It is clear to me how the performance of other team roles affects my own role performance.	5.71	0.551
7.	The specific duties and behaviors of the other roles on my team are clear to me.	5.52	0.773
8.	I feel confident that I have the necessary skills to fulfill my role.	5.85	0.364
9.	I feel comfortable with my role on the team.	5.34	0.993
10.	If necessary, I believe I could take any of the other roles on my team.	4.31	1.845
	Average =	5.476	

Appendix I - Table 4 Average Rating and Standard Deviations for Team Questionnaire Items (Training Team Data)

	Item	Average Rating	Standard Deviation
1.	I feel confident in my team's ability to work together.	5.42	0.920
2.	I feel competitive with the other team members.	2.21	1.133
3.	I would describe myself as flexible when working on the team.	5.41	0.767
4.	I lack influence on my team.	1.79	1.145
5.	I trust the other team members.	5.32	0.874
6.	I would characterize my behavior on the team as aggressive.	2.92	1.763
7.	I feel committed to my team.	5.39	0.886
8.	I would say that my behavior enhances the team's effectiveness.	5.60	0.783
9.	I have warm feelings toward the other team members.	5.34	0.970
10.	I find it difficult to reveal facts about myself to the other team members.	2.51	1.372
11.	I believe the other members of my team have positive feelings toward me.	5.35	0.678

Appendix I - Table 5. Team Scale Deviation Scores* By Team and Position**

Variable	Number of Responses	Deviation From Average Rating
Team		
1	29	0.22
2	38	-0.17
Position		
Team Leader	23	0.12
Team Member	23	0.12
Observer	21	-0.26

* Items 1, 3, 5, 7, 8, 9, and 11 on the Team Questionnaire.

** Adjusted for mutual influence (Team adjusted for Position and vice-versa).

Appendix I- Table 6. Deviation Scores For Three Items From Team Questionnaire By Team and Position*

Variable	Number of Responses	Item 2 (Competitiveness)	Item 4 (Influence)	Item 6 (Aggressiveness)
Team				
1	29	-0.49	-0.16	0.08
2	38	0.37	0.12	-0.06
Position				
Team Leader	23	-0.51	-0.40	-0.95
Team Member	23	0.39	0.02	0.78
Observer	21	0.12	0.41	0.18

* Team adjusted for Position and vice-versa.

Appendix I - Table 7. Average Rating and Standard Deviations for Self Questionnaire Items (Training Team Data)

	Item	Average Rating	Standard Deviation
1.	I work well with the people with whom I come in contact.	5.48	0.887
2.	In general, I feel satisfied with my work performance.	5.56	0.696
3.	I have the ability to communicate effectively with others.	5.46	0.565
4.	I am capable of insight into my own motives, feelings, and conflicts.	5.25	0.596
5.	In general, I am able to develop satisfying relationships with others.	5.43	0.670
6.	I am able to give useful information to others about the apparent effectiveness of their work or actions.	5.28	0.662
7.	In regard to this training program, I would describe myself as being motivated.	5.54	0.647
8.	In regard to this training program, I would describe myself as being involved.	5.67	0.700
9.	I would rate my knowledge of the MSIS Training Program as high.	5.13	1.522
10.	I feel satisfied with the amount of knowledge I have of the MSIS Training Program.	4.97	1.329

Appendix I - Table 8. Self Scale Deviations by Team and Position[a]

Variable		Number of Responses	Deviation From Average Rating
Team			
	1	26	0.35
	2	31	-0.30
Position			
	Team Leader	18	0.46
	Team Member	21	0.26
	Observer	18	-0.76

[a] Adjusted for mutual influence (Team adjusted for Position and vice-versa).

APPENDIX II

DESCRIPTION OF CONTENTS

This is Appendix II to the Final Report B, MSIS Training, dated 1979.

This appendix contains copies of all of the instruments used in the collection of data for evaluation of the MSIS training.

11B1
(1-4)

MSIS BACKGROUND INFORMATION

Name: _____ (5-30) Postal Code: ___ (31-32) Date: / / / / / Month Day Year (33-38)

1. Circle which MSIS training courses you have already taken:
   (39) a. None. Go to question 2.
   (40) b. MSIS Overview
   (41) c. MSIS Subsystems
   (42) d. Data Entry

2. Have you filled out one of these MSIS Background Information forms before?
   (43) ___Yes. Thank you for the data; go to the Pre-test.
   (44) ___No. Go to question 3.

3. Age: ___ years (45)

4. Sex: ___ (46) M ___ (47) F

5. What was the highest level of schooling you attained?(circle one)

   9 10 11 12 (48) High School | 13 14 15 16 (49) College | M.A./M.S. (50) | Ph.D (51)

   Other (please specify) _____ (52-76)

6. Specify your major where appropriate:

   _____ (77) College | _____ (78) M.A./M.S. | _____ (79) Ph.D. | _____ (80) Other

7. What is your job title? _____ (5-30)

8. How long have you held your present position? ___ (31) years ___ (32) months

9. How many years experience do you have in the general area of your present job position?

   _____ (33-34)

10. Have you had training related to your present position in the past two years (other than the present MSIS training)?

(35) ___No. Go to question 11.

(36) ___Yes. Please answer the following:

a. What was the subject? _____ (37) (51)

b. What was the length of training? _____ (52) (55)

c. Who offered the training? _____ (56) (65)

d. Rate your knowledge resulting from the training.

(66) None (67) A little (68) Some

(69) Quite a bit (70) Great deal

11. Please rate your current knowledge level of data processing (circle the appropriate answer).

(71) None (72) A little (73) Some

(74) Quite a bit (75) Great deal

12. Please rate your current knowledge level of the Federal Regulations pertaining to Safe Drinking Water Act of 1974 (circle the appropriate answer).

(75) None (77) A little (78) Some

(79) Quite a bit (80) Great deal

Thank you for your cooperation.

PRESENTATION EVALUATION

State _____ Subject Presented _____

Date _____ Presenter's Name _____

INSTRUCTIONS: For each of the following statements, fill in the number 1, 2, 3, 4, 5, or 6 to indicate the extent to which you agree or disagree with the statement made. This is meant to be a general or average type of rating. For example, you might find yourself agreeing for the most part with a statement, but disagreeing somewhat. In this case, since you agree more than disagree, you might give a rating of 4 (slightly agree) or 5 moderately agree).

The following code applies:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

---

This evaluation applies only to the presentation just finished.

____ The presentation was clear and understandable.

____ The presenter seemed to know the subject.

____ The presentation was interesting.

____ The presenter encouraged questions and discussion.

____ The presentation was thought-provoking.

____ The presenter showed interest and enthusiasm.

____ The presentation was well-organized.

____ The presenter seemed to have a genuine interest in the participants.

____ The information presented seemed worthwhile.

____ The presenter made good use of teaching aids.

On a ten point scale where one is the lowest and ten is the highest, I would give the presentation a rating of (circle one)

1 2 3 4 5 6 7 8 9 10

ADDITIONAL COMMENTS: (Use back of page if necessary)

WORKSHOP EVALUATION

State _____ Subject Presented _____

Date _____ Presenter's Name _____

INSTRUCTIONS: For each of the following statements, fill in the number 1, 2, 3, 4, 5, or 6 to indicate the extent to which you agree or disagree with the statement made. This is meant to be a general or average type of rating. For example, you might find yourself agreeing for the most part with a statement, but disagreeing somewhat. In this case, since you agree more than disagree, you might give a rating of 4 (slightly agree) or 5 moderately agree). The following code applies:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

---

Apply these statements only to the workshop just finished.

____ The workshop seemed well-timed.

____ The workshop had a clear application to the stated training goals.

____ I found the workshop useful.

____ The workshop met my own needs.

____ I enjoyed the workshop.

____ It was clear to me why the workshop was included.

____ The workshop helped satisfy my own goals.

____ I was comfortable with the workshop.

____ The workshop was challenging.

____ The workshop met my expectations.

____ The workshop helped clarify the lecture material.

____ I learned things in the workshop not covered in the lecture.

On a ten point scale where one is the lowest and ten is the highest, I would give the workshop a rating of (circle one)

1 2 3 4 5 6 7 8 9 10

ADDITIONAL COMMENTS: (Use back of page if necessary)

ROLE QUESTIONNAIRE

Date _____ ID # _____ Team _____

INSTRUCTIONS: For each of the following statements, fill in the number 1, 2, 3, 4, 5, or 6 to indicate the extent to which you agree or disagree with the statement made. This is meant to be a general or average type of rating. For example, you might find yourself agreeing for the most part with a statement, but disagreeing somewhat. In this case, since you agree more than disagree, you might give a rating of 4 (slightly agree) or 5 (moderately agree).

The following code applies:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

---

____ The rationale for the existence of my role is clear to me.

____ It is evident to me how my role helps achieve the overall goals of the MSIS Training Program.

____ The specific duties and behaviors of my role are clear to me.

____ I am aware of the expectations of the other team members concerning my role.

____ I am clear about my expectations for the other team roles.

____ It is clear to me how the performance of other team roles affects my own role performance.

____ The specific duties and behaviors of the other roles on my team are clear to me.

____ I feel confident that I have the necessary skills to fulfill my role.

____ I feel comfortable with my role on the team.

____ If necessary, I believe I could take any of the other roles on my team.

ADDITIONAL COMMENTS: (Use back of page if necessary)

SELF QUESTIONNAIRE

Date _____ ID # _____ Team _____

INSTRUCTIONS: For each of the following statements, fill in the number 1, 2, 3, 4, 5, or 6 to indicate the extent to which you agree or disagree with the statement made. This is meant to be a general or average type of rating. For example, you might find yourself agreeing for the most part with a statement, but disagreeing somewhat. In this case, since you agree more than disagree, you might give a rating of 4 (slightly agree) or 5 (moderately agree).

The following code applies:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

---

____ I work well with the people with whom I come in contact.

____ In general, I feel satisfied with my work performance.

____ I have the ability to communicate effectively with others.

____ I am capable of insight into my own motives, feelings, and conflicts.

____ In genreal, I am able to develop satisfying relationships with others.

____ I am able to give useful information to others about the apparent effectiveness of their work or actions.

____ In regard to this training program, I would describe myself as being motivated.

____ In regard to this training program, I would describe myself as being involved.

____ I would rate my knowledge of the MSIS Training Program as high.

____ I feel satisfied with the amount of knowledge I have of the MSIS Training Program.

ADDITIONAL COMMENTS: (Use back of page if necessary)

TEAM QUESTIONNAIRE

Date _____ ID # _____ Team _____

INSTRUCTIONS: For each of the following statements, fill in the number 1, 2, 3, 4, 5, or 6 to indicate the extent to which you agree or disagree with the statement made. This is meant to be a general or average type of rating. For example, you might find yourself agreeing for the most part with a statement, but disagreeing somewhat. In this case, since you agree more than disagree, you might give a rating of 4 (slightly agree) or 5 (moderately agree).

The following code applies:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

---

____ I feel confident in my team's ability to work together.

____ I feel competitive with the other team members.

____ I would describe myself as flexible when working on the team.

____ I lack influence on my team.

____ I trust the other team members.

____ I would characterize my behavior on the team as aggresive.

____ I feel committed to my team.

____ I would say that my behavior enhances the team's effectiveness.

____ I have warm feelings toward the other team members.

____ I find it difficult to reveal facts about myself to the other team members.

____ I believe the other members of my team have positive feelings toward me.

ADDITIONAL COMMENTS: (Use back of page if necessary)

I.2.T1
11T2
(1-4)

PRE-TEST and POST-TEST

MSIS OVERVIEW

Name: _____ (5) (30) Postal Code _____ (31-2) Date ____/____/____ Mo. Day Year (33-38)

1. Circle the purpose of the Safe Drinking Water Act:

   ( ) a. Monitor drinking water quality
   ( ) b. Assure the public is provided with safe drinking water
   ( ) c. Report to the federal government drinking water quality

2. Circle the four primary contaminant categories named in the act:

   ( ) a. Chemical
   ( ) b. Taste
   ( ) c. Physical
   ( ) d. Metaphysical
   ( ) e. Odor
   ( ) f. Biological
   ( ) g. Radiological

3. Circle T (True) or F (False) for the following statements:

   T ( ) F — Primary regulations pertain to aspects of drinking water that affect the public health.

   T ( ) F — The final primary EPA regulations are in effect.

   T ( ) F — The state must, among other things, keep records and report to the federal government about drinking water to assume and keep primacy.

   T ( ) F — A PWS msut report the results of an analysis to the state within two days and a violation within 40 days.

   T ( ) F — Newly granted variances and exemptions must be reported annually by the state to EPA.

T ( ) F Additions and corrections to the State's PWS inventory must be reported by the State annually to EPA.

T ( ) F A summary of enforcement actions is reported promptly by the State to EPA.

T ( ) F MSIS was developed as a centralized system.

T ( ) F MSIS is a batch computer system.

4. Circle the appropriate answer:

Which of the following is a basic service of MSIS?

( ) a. On-line laboratory analysis
( ) b. Sampling water
( ) c. Analyzing sanitary survey results
( ) d. Keeping records

5. Circle the following abbreviations which stand for names of MSIS subsystems:

( ) a.	REGS	( ) d.	BIPS	( ) g.	VAEX
( ) b.	TURB	( ) e.	CMCL	( ) h.	QUAL
( ) c.	FEDR	( ) f.	WAQC	( ) i.	ENAC

6. How many subsystems does MSIS have? ( ) _____

7. Match each subsystem with its appropriate function:

Subsystem		Function	
a.	Regulations	( ) ___	Automatically translates the PWS Inventory File into MSIS format.
b.	Enforcement Actions	( ) ___	Maintains data on PWS's having special conditions.
c.	Water Qualtiy Compliance	( ) ___	Checks analyses of water quality to see if authorized methods were used.
d.	Public Water System Inventory	( ) ___	Performs common functions for other subsystems.
e.	Variances & Exemptions	( ) ___	Contains the criteria used to determine violations.
f.	Standard Processing	( ) ___	Keeps information on compliance actions.

8. Circle T (True) or F (False) for the following statements:

T ( ) F MSIS is a subsystem name as well as the system name.

T ( ) F FEDR creates printed reports for the federal government.

T ( ) F Any laboratory may submit analysis results.

9. Rate your current level of knowledge about MSIS:

None
A little
Some
Quite a bit
A great deal

II.2.T2
22T2
(1-4)

PRE-TEST and POST-TEST

MSIS Subsystems

Name: _____ (5-30) Postal Code _____ (31-32) Date ___/___/___ Mo. Day Year (33-38)

1. Circle T (True) or F (False) for each of the following statements:

T ( ) F ( ) There are six volumes of MSIS documentation.

T ( ) F ( ) The DED contains record definitions.

T ( ) F ( ) The DED contains the acceptable values for each data element.

T ( ) F ( ) The length of any field in MSIS can be found in the DED.

T ( ) F ( ) The DED is in alphabetical order.

T ( ) F ( ) One common use of the DED is to determine exact data element mnemonic names.

T ( ) F ( ) The DEI is in alphabetical order.

T ( ) F ( ) The DEI contains instructions for every field of every input form and turn-around document.

T ( ) F ( ) The numeric input form number is unique for each input form.

T ( ) F ( ) Turn-around documents are signified by a 300 series number.

T ( ) F ( ) The User's Manual describes all the fields on all the MSIS reports.

T ( ) F ( ) The User's Manual contains lists of all the MSIS required fields and all the EPA requested fields.

2. Match the types of input forms with their function.

a.	Processing Options	( ) ___ Enters data the computer often uses.
b.	Table Creation	
c.	Record Creation and Maintenance	( ) ___ Enters PWS-related data to files.
d.	Water Quality Transactions	( ) ___ Enters samples and analysis data.
		( ) ___ Enters instructions to the computer.

3. Circle the correct answer REGS, MSIS, and SRVY subsystems do not have Record Creation and Maintenance Forms because:

( ) a. They don't have any files.
( ) b. They only print reports.
( ) c. They don't maintain PWS data.

4. Match each subsystem with it appropriate function:

Subsystem		Function
a. Regulations	( ) ___	Automatically translates the PWS Inventory File into MSIS format
b. Enforcement Actions		
c. Water Quality Compliance		
d. Public Water System Inventory	( ) ___	Maintains data on PWS's having special conditions
e. Variances & Exemptions	( ) ___	Checks analyses of water quality to see if authorized methods were used
f. Standard Processing	( ) ___	Performs common functions for other subsystems
	( ) ___	Contains the criteria used to determine violations
	( ) ___	Keeps information on compliance actions

5. Circle T (True) or F (False) for the following statements:

T ( ) F A summary of State enforcement actions is reported annually.

T ( ) F Tables and files are both accessible to the user for selecting reports.

T ( ) F Water quality transaction input forms are used to enter analytical results.

6. Rate your current level of knowledge about MSIS:

( ) None
( ) A little
( ) Some
( ) Quite a bit
( ) A great deal

PRE-TEST and POST-TEST

DATA ENTRY

Name: _____ (5-30) Postal Code____ (31-2) Date___/___/___ Mo. Day Year (33-8)

1. Circle the abbreviations for the 5 subsystems which have Record creation and maintenance input forms:

( ) a. BIPS	( ) e. FEDR	( ) i. SRVY
( ) b. WAQC	( ) f. VAEX	( ) j. MSIS
( ) c. OPER	( ) g. REGS	( ) k. PWSI
( ) d. LIMT	( ) h. ENAC	( ) l. QUAL

2. Circle T (True) or F (False) for each of the following statements:

T F ( ) The laboratory input form is seldom used because the laboratory table is supplied by MSIS.

T F ( ) A State used the Code Value Table input form to enter its own acceptable data element values.

T F ( ) The Data Element Table input form is used to enter a detailed description of information about a data element.

T F ( ) A Record Creation and Maintenance input form is used to change PWS data.

T F ( ) Water Quality Transactions input forms are used either to add or to delete sample and analysis data.

T F ( ) The records on the Periodic Sample File and Sample Analysis File can be changed without deleting the entire record.

3. The Data Element Table input form cannot be used to identify which of the following:

( ) a. Which file used in	( ) c. Name for field
( ) b. New error code	( ) d. New catalogue number

4. Check the Water Quality Transaction input forms:

( ) a. ___ Bacteriological or Turbidity Analysis
( ) b. ___ Inorganic Chemical Contaminant
( ) c. ___ Chemical or Radiological Analysis
( ) d. ___ Sample Deletion Transactions
( ) e. ___ Physical Contaminant Summary

5. Rate your current level of knowledge about MSIS: (Circle one)

( ) None ( ) A little ( ) Some ( ) Quite a bit ( ) A great dea

PRE-TEST and POST-TEST

SELECTION PROCESS

Name: _____ (5-30) Postal Code _____ (31-2) Date ___/___/___ Mo. Day Year (33-8)

21. Circle T (True) or F (False) for the following statements:

T F (39) "PROC" is a processing option input form used both to initiate a program and to specify the subsystem to be run.

T F (40) SEL1 and SEL2 are always used together to specify selection criteria.

T F (41) SEL1 and SEL2 allow the user to select records based on the value of a particular field or data element common to all records.

T F (42) Selection of records can be performed across subsystems.

T F (43) The Data Element Logic ID number on "SEL1" and "SEL2" is used only to associate the information on the two forms.

T F (44) "SORT" is a processing option input form used to specify a desired sequence of records for output.

T F (45) The Sort Sequence numbers must be entered on the "SORT" form in ascending consecutive sequence.

T F (46) The Sort Mode must be specified as either an ascending or a descending order.

T F (47) The Sanitary Survey PROC form is used to enter the results of a sanitary survey.

T F (48) The Sanitary Survey SORT form is required when scheduling sanitary surveys.

T F (49) The "and" conditional statement means a record will be selected if it fulfills all the requirements specified.

T F (50) The "and" and "or" conditional statements may be entered simultaneously to select records.

22. Circle the abbreviations of the six subsystems which use the selection forms.

(51) a.	PWSI	(55) e.	WAQC	(59) i.	ENAC
(52) b.	REGS	(56) f.	QUAL	(60) j.	COMP
(53) c.	MSIS	(57) g.	VAEX	(61) k.	OPER
(54) d.	FEDR	(58) H.	BIPS	(62) l.	SURY

23. Circle <u>all</u> of the following that are true:

(63) a. The maximum number of SEL1 entries is 35.
(64) b. The maximum number of SEL2 entries is 35.
(65) c. The maximum number of SEL2's that may be entered in one selection run is 35.

24. Circle all of the following statements which describe what the PROC form <u>can</u> specify.

(66) a. The date of the output
(67) b. The period covered by the output
(68) c. The criteria for selecting records for output
(69) d. Report options
(70) e. Standard error processing options
(71) f. The order of the output
(72) g. The purge date of a file

25. Circle all of the following which must be specified on the SORT form to perform its function.

(73) a. Ascending or descending order
(74) b. The value of the data element to be used
(75) c. The data element to be used
(76) d. The sequence of the data elements to be used
(77) e. Relation symbols

26. Rate your current level of knowledge about MSIS. (Circle one)

(78) None (79) A little (80) Some

(81) Quite a bit (82) Great deal

FINAL WATER TRAINING EVALUATION

STATE _____

DATE _____

Name _____ Position/Job Title _____

_____

In answering the questions below, consider yourself and your position, not what you think others might feel, or need in the way of training.

AMOUNT OF INFORMATION BY SUBJECT

Think about the amount of information presented on each subject listed below. Place an "x" in one column to indicate whether the amount of information presented was too little, too much, or about right.

Subject	Too Little	Too Much	About Right
1. National Safe Drinking Water Act			
2. Federal Regulations			
3. Subsystem Functions			
4. Files			
5. Tables			
6. Documentation			
7. Table Creation Input Form			
8. Record Creations and Maintenance Input Form			
9. Water Quality Transaction Input Form			
10. Output Reports			

	Too Little	Too Much	About Right
Selection Process			
11. PROC	_____	_____	_____
12. SORT	_____	_____	_____
13. SEL1 and SEL2	_____	_____	_____
14. SRVY	_____	_____	_____
15. Training Summary	_____	_____	_____
16.	_____	_____	_____
17.	_____	_____	_____

Note: Use 16 and 17 to enter any other subject you want to rate.

AMOUNT OF INFORMATION BY AREA

Think about the relative amount of information presented in each area listed below. Place an "x" in one column to indicate whether the relative amount of information presented was too little, too much, or about right.

Area	Too Little	Too Much	About Right
18. Lecture	_____	_____	_____
19. Work Shops	_____	_____	_____
20. Informal Discussions	_____	_____	_____

NUMBER AND CLASSIFICATION OF PERSONNEL

Place an x in the blanks below to indicate whether the number and classification of personnel were too many, too few, or about right.

21. The number of personnel attending was too many ____, too few ____ or about right ____.

22. The job classifications from which personnel were selected were too few ____, too many ____ or about right ____.

INSTRUCTIONS: For statements 23 through 50, fill in the number 1, 2, 3, 4, 5, or 6 to indicate the extent to which you agree or disagree with the statement made. This is meant to be a general or average type of rating. For example, you might find yourself agreeing for the most part with a statement, but disagreeing somewhat. In this case, since you agree more than disagree, you might give a rating of 4 (slightly agree) or 5 (moderately agree).

The following code applies:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

WORKSHOP EVALUATION

23. ____ The workshops seemed well-timed.

24. ____ The workshops had a clear application to the training goals.

25. ____ I found the workshops useful.

26. ____ The workshops met my own needs.

27. ____ I enjoyed the workshops.

28. ____ It was clear to me why the workshops were included.

29. ____ The workshops helped satisfy my own goals.

30. ____ I was comfortable with the workshops.

31. ____ The workshops were challenging.

32. ____ The workshops met my expectations.

33. ____ The workshops helped clarify the lecture material.

34. ____ I learned things in the workshops not covered in the lecture.

PRESENTER EVALUATION

35. ____ The presentations were clear and understandable.

36. ____ The presenters seemed to know the subject.

37. ____ The presentations were interesting.

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

38. ____ The presenters encouraged questions and discussions.

39. ____ The presentations were thought-provoking.

40. ____ The presenters showed interest and enthusiasm.

41. ____ The presentations were well-organized.

42. ____ The presenters seemed to have a genuine interest in the participants.

43. ____ The information presented seemed worthwhile.

44. ____ The presenters made good use of teaching aids.

OTHER EVALUATION

45. ____ The length of the Water Training should be increased.

45. ____ I need more training from SWORCC personnel in some areas.

47. ____ There was too much dependency on the use of 35 millimeter slides.

48. ____ I liked it when the presenters were informal.

49. ____ There was too much dependency on the use of newsprint.

50. ____ I know enough about MSIS to do my job.

GENERAL INFORMATION

51. Two things that I liked best were:

a. _____

_____

_____

b. _____

_____

_____

52. Two things that I liked least were:

a. _____

_____

_____

b. _____

_____

_____

53. My two specific recommendations to SWORCC are:

a. _____

_____

_____

b. _____

_____

_____

54. My two specific recommendations to my State are:

a. _____

_____

_____

b. _____

_____

_____

55. My personal goals and/or expectations for the MSIS Water Training Program were:

_____

_____

_____

56. Rate your current level of knowledge on MSIS. (check one)

None ____ Some ____ A great deal ____

A little ____ Quite a bit ____

Overall Rating

On a scale of one to ten where one is the lowest and ten is the highest, I would score, overall (circle one)

57. The Presentations

1 2 3 4 5 6 7 8 9 10

58. The Workshops

1 2 3 4 5 6 7 8 9 10

59. The entire MSIS Water Training

1 2 3 4 5 6 7 8 9 10

60. Use the space below for any other comments you would like to make.

_____

_____

_____

_____

_____

_____

_____